MULTIMEDIA UNIVERSITY

STUDENT ID NO

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

# MULTIMEDIA UNIVERSITY

# FINAL EXAMINATION

**TRIMESTER 1, 2022/2023 (TERM ID 2210)**

## BFN3144 – FINANCIAL DERIVATIVES

(All sections / Groups)

07 FEBRUARY 2023
2:30 p.m – 4:30 p.m
(2 Hours)

---

**INSTRUCTIONS TO STUDENT**

1. This Question paper consists of 5 pages with 4 questions (excluding the cover page).
2. Attempt **ALL** questions. The distribution of the marks for each question is given.
3. Students are allowed to use non-programmable scientific and financial calculators.
4. Please write all your answers in the Answer Booklet provided.

**Answer ALL questions in the answer booklet provided.**

## QUESTION 1

a) The key function of financial derivatives is risk management. Evaluate at least **FIVE (5)** type of risks which may affect the returns from an investment.

(15 marks)

b) Due to market uncertainties, Vincent believes that FBM KLCI and FKLI are mismatched significantly for January 2023 prices. Today, November, the quotation of FBM KLCI is at 1420 while January 2023 FKLI at 1550. Risk-free rate is at 6.5% per annum and expected dividend yield is 4.8%. At maturity on the last day November, both prices converged at 1580. You are requested to help him to establish his arbitrage activity by showing him an arbitrage profit, if any.

(10 marks)

(Total: 25 marks)

**Continued ...**

## QUESTION 2

a) According to Cox (2022), he stated that the Federal Reserve Chair Jerome Powell is strongly committed to fight inflation. Given the above statement, market is expecting the interest rate to hike in the coming months in order to fight inflation. As the trader, you are required to take position to gain profit from the above expectation. Information as provided below:

Quotation:

3-month KLIBOR = 4.50%
June KLIBOR futures = 94.50

i) Construct the most appropriate strategy and justify your strategy.

(5 marks)

ii) Show the estimated profits from the futures if the interest rate goes up by 2.00%. It is assumed that KLIBOR futures will converge at the maturity

(5 marks)

b) Due to the firm action from the US FED, you believe that the market may have the potential of mispricing. Details as shown below:

Current market data are as follows:
3-month KLIBOR rate : 6.80%
6-month KLIBOR rate : 7.80%
3-month KLIBOR futures: 89.50

It is expected that the KLIBOR futures will converge at the maturity. Assume that Smith can borrow or lend RM1,000,000.

i) Evaluate how Mr. Sim is able to determine whether an arbitrage exists. Determine the correct price.

(8 marks)

ii) Based on the above calculation, what the most appropriate strategy? Convergence is expected to happen.

(2 marks)

iii) What is the expected profit/loss if the interest rate increased by 2%? Convergence is expected to happen.

(5 marks)

(Total: 25 marks)

**Continued ...**

## QUESTION 3

You are expecting the price of Axiata Berhad to be moving downward in a slow manner. You intended to profit from the expectation of price movement but unwilling to expose yourself to large potential losses if the stock price goes against his expectation. The following 3-month call options on Axiata Berhad are available.

Axiata Berhad RM 4.50 Call @ 0.75
Axiata Berhad RM 5.50 Call @ 0.10

a) Suggest the most appropriate strategy based on the above information. Justify the used strategy.

(5 marks)

b) Prepare the payoff table and payoff graph based on the strategy above. Indicate maximum profit, limited loss and breakeven price in both table and graph.

(20 marks)

(Total: 25 marks)

## QUESTION 4

a) Currently, Sime Darby Berhad is trading at RM 4.50 per share and the exercise price of its 3-month calls with RM 3.60 exercise price. The risk-free rate of interest expected to prevail is 3.5% per annum while estimate of the underlying stock volatility is 0.3. Using Black Scholes Option Pricing Model, calculate the call value.

(20 marks)

**Continued ...**

b)

Bernama, September 27, 2022 17:36 pm

BNM, Bank Indonesia renew local currency bilateral swap agreement of up to RM8 bil

KUALA LUMPUR (Sept 27): Bank Negara Malaysia (BNM) and Bank Indonesia have renewed the local currency bilateral swap agreement (LCBSA) of up to RM8 billion/28 trillion rupiah on Sept 23 (last Friday), to reinforce the ongoing cooperation by both central banks.

The LCBSA, effective for a period of three years, was renewed following the first agreement which was signed in 2019.

BNM governor Tan Sri Nor Shamsiah Mohd Yunus said the central bank is pleased to continue its cooperation with Bank Indonesia by renewing the LCBSA, given the significant trade flows between Malaysia and Indonesia.

"The LCBSA supplements the Local Currency Settlement Framework (LCSF) between our two countries, an arrangement that facilitates settlement of trade and investments in local currency," she said in a statement on Tuesday (Sept 27).

Meanwhile, Bank Indonesia governor Perry Warjiyo said Bank Indonesia believes that the swap arrangement renewal reflects the strong ongoing financial cooperation between Bank Indonesia and BNM.

"The renewal also shows our commitment to strengthen financial market stability by promoting more extensive use of local currencies for bilateral transactions between Indonesia and Malaysia," he added.

(Source adapted from https://www.theedgemarkets.com/article/bnm-bank-indonesia-renew-local-currency-bilateral-swap-agreement-rm8-bil)

Based on the above article, rationalise at least **ONE (1)** objective and support with example.

(5 marks)

(Total: 25 marks)

**Continued ...**

**Table: Cumulative Normal Distribution**

| $d$ | N($d$) | $d$ | N($d$) | $d$ | N($d$) | $d$ | N($d$) | $d$ | N($d$) | $d$ | N($d$) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| −3.00 | .0013 | −1.58 | .0571 | −0.76 | .2236 | 0.06 | .5239 | 0.86 | .8051 | 1.66 | .9515 |
| −2.95 | .0016 | −1.56 | .0594 | −0.74 | .2297 | 0.08 | .5319 | 0.88 | .8106 | 1.68 | .9535 |
| −2.90 | .0019 | −1.54 | .0618 | −0.72 | .2358 | 0.10 | .5398 | 0.90 | .8159 | 1.70 | .9554 |
| −2.85 | .0022 | −1.52 | .0643 | −0.70 | .2420 | 0.12 | .5478 | 0.92 | .8212 | 1.72 | .9573 |
| −2.80 | .0026 | −1.50 | .0668 | −0.68 | .2483 | 0.14 | .5557 | 0.94 | .8264 | 1.74 | .9591 |
| −2.75 | .0030 | −1.48 | .0694 | −0.66 | .2546 | 0.16 | .5636 | 0.96 | .8315 | 1.76 | .9608 |
| −2.70 | .0035 | −1.46 | .0721 | −0.64 | .2611 | 0.18 | .5714 | 0.98 | .8365 | 1.78 | .9625 |
| −2.65 | .0040 | −1.44 | .0749 | −0.62 | .2676 | 0.20 | .5793 | 1.00 | .8414 | 1.80 | .9641 |
| −2.60 | .0047 | −1.42 | .0778 | −0.60 | .2743 | 0.22 | .5871 | 1.02 | .8461 | 1.82 | .9656 |
| −2.55 | .0054 | −1.40 | .0808 | −0.58 | .2810 | 0.24 | .5948 | 1.04 | .8508 | 1.84 | .9671 |
| −2.50 | .0062 | −1.38 | .0838 | −0.56 | .2877 | 0.26 | .6026 | 1.06 | .8554 | 1.86 | .9686 |
| −2.45 | .0071 | −1.36 | .0869 | −0.54 | .2946 | 0.28 | .6103 | 1.08 | .8599 | 1.88 | .9699 |
| −2.40 | .0082 | −1.34 | .0901 | −0.52 | .3015 | 0.30 | .6179 | 1.10 | .8643 | 1.90 | .9713 |
| −2.35 | .0094 | −1.32 | .0934 | −0.50 | .3085 | 0.32 | .6255 | 1.12 | .8686 | 1.92 | .9726 |
| −2.30 | .0107 | −1.30 | .0968 | −0.48 | .3156 | 0.34 | .6331 | 1.14 | .8729 | 1.94 | .9738 |
| −2.25 | .0122 | −1.28 | .1003 | −0.46 | .3228 | 0.36 | .6406 | 1.16 | .8770 | 1.96 | .9750 |
| −2.20 | .0139 | −1.26 | .1038 | −0.44 | .3300 | 0.38 | .6480 | 1.18 | .8810 | 1.98 | .9761 |
| −2.15 | .0158 | −1.24 | .1075 | −0.42 | .3373 | 0.40 | .6554 | 1.20 | .8849 | 2.00 | .9772 |
| −2.10 | .0179 | −1.22 | .1112 | −0.40 | .3446 | 0.42 | .6628 | 1.22 | .8888 | 2.05 | .9798 |
| −2.05 | .0202 | −1.20 | .1151 | −0.38 | .3520 | 0.44 | .6700 | 1.24 | .8925 | 2.10 | .9821 |
| −2.00 | .0228 | −1.18 | .1190 | −0.36 | .3594 | 0.46 | .6773 | 1.26 | .8962 | 2.15 | .9842 |
| −1.98 | .0239 | −1.16 | .1230 | −0.34 | .3669 | 0.48 | .6844 | 1.28 | .8997 | 2.20 | .9861 |
| −1.96 | .0250 | −1.14 | .1271 | −0.32 | .3745 | 0.50 | .6915 | 1.30 | .9032 | 2.25 | .9878 |
| −1.94 | .0262 | −1.12 | .1314 | −0.30 | .3821 | 0.52 | .6985 | 1.32 | .9066 | 2.30 | .9893 |
| −1.92 | .0274 | −1.10 | .1357 | −0.28 | .3897 | 0.54 | .7054 | 1.34 | .9099 | 2.35 | .9906 |
| −1.90 | .0287 | −1.08 | .1401 | −0.26 | .3974 | 0.56 | .7123 | 1.36 | .9131 | 2.40 | .9918 |
| −1.88 | .0301 | −1.06 | .1446 | −0.24 | .4052 | 0.58 | .7191 | 1.38 | .9162 | 2.45 | .9929 |
| −1.86 | .0314 | −1.04 | .1492 | −0.22 | .4129 | 0.60 | .7258 | 1.40 | .9192 | 2.50 | .9938 |
| −1.84 | .0329 | −1.02 | .1539 | −0.20 | .4207 | 0.62 | .7324 | 1.42 | .9222 | 2.55 | .9946 |
| −1.82 | .0344 | −1.00 | .1587 | −0.18 | .4286 | 0.64 | .7389 | 1.44 | .9251 | 2.60 | .9953 |
| −1.80 | .0359 | −0.98 | .1635 | −0.16 | .4365 | 0.66 | .7454 | 1.46 | .9279 | 2.65 | .9960 |
| −1.78 | .0375 | −0.96 | .1685 | −0.14 | .4443 | 0.68 | .7518 | 1.48 | .9306 | 2.70 | .9965 |
| −1.76 | .0392 | −0.94 | .1736 | −0.12 | .4523 | 0.70 | .7580 | 1.50 | .9332 | 2.75 | .9970 |
| −1.74 | .0409 | −0.92 | .1788 | −0.10 | .4602 | 0.72 | .7642 | 1.52 | .9357 | 2.80 | .9974 |
| −1.72 | .0427 | −0.90 | .1841 | −0.08 | .4681 | 0.74 | .7704 | 1.54 | .9382 | 2.85 | .9978 |
| −1.70 | .0446 | −0.88 | .1894 | −0.06 | .4761 | 0.76 | .7764 | 1.56 | .9406 | 2.90 | .9981 |
| −1.68 | .0465 | −0.86 | .1949 | −0.04 | .4841 | 0.78 | .7823 | 1.58 | .9429 | 2.95 | .9984 |
| −1.66 | .0485 | −0.84 | .2005 | −0.02 | .4920 | 0.80 | .7882 | 1.60 | .9452 | 3.00 | .9986 |
| −1.64 | .0505 | −0.82 | .2061 | 0.00 | .5000 | 0.82 | .7939 | 1.62 | .9474 | 3.05 | .9989 |
| −1.62 | .0526 | −0.80 | .2119 | 0.02 | .5080 | 0.84 | .7996 | 1.64 | .9495 | | |
| −1.60 | .0548 | −0.78 | .2177 | 0.04 | .5160 | | | | | | |

This table shows the probability [N($d$)] of observing a value less than or equal to $d$. For example, as illustrated, if $d$ is −.24, then N($d$) is .4052.

**End of Paper**